CLAIMS

1. A system for processing cards including a magnetic medium extending along one side of the cards and printing on both sides of the cards comprising:

a plurality of card processing stations spaced along a card transport extending between a card input and a card output with the stations comprising a combined magnetic encoding and a card flipping station which encodes the magnetic medium and which flips individual cards as held by the combined magnetic encoding and card flipping station from one side after printing the one side to another side to permit printing on the another side of the cards, and a printing station which prints both sides of the cards;

a first drive motor which drives a transmission coupling the motor to a card drive associated with each station to transport the cards at each station during processing thereof;

a second drive motor which rotates the combined magnetic encoding and card flipping station from a first rotational position to a second rotational position displaced substantially 180° from the first rotational position to flip the cards contained in the combined magnetic encoding and card flipping station; and

a controller which controls operation of the stations and the first and second motors so that cards are sequentially processed at the combined magnetic encoding and flipping station to encode the magnetic medium, to transport the cards to the printing station to print one of the sides thereof, to transport the cards back to the combined magnetic encoding and flipping station

where the cards are flipped to a reverse orientation of the sides of the cards for printing on the another side of the cards and to transport the cards back to the printing station to print on the another side of the cards.

2. A system in accordance with claim 1 wherein:

the plurality of card processing stations include a smart card encoding station located between the input and the combined magnetic encoder and card flipping station; and wherein

the first drive motor drives the transmission to drive a card drive at the smart card encoding station and the controller causes the cards to be transported by the first motor and transmission from the input to the smart encoding station by the transmission driving the card drive of the smart encoding station where an integrated circuit associated each card is encoded and then each card with the associated encoded integrated circuit is transported to the combined magnetic encoding and flipping station for processing.

3. A system in accordance with claim 1 wherein:

the card drive of the combined magnetic encoding and flipping station comprises a drive roller, which drives cards in forward and reverse directions along the card transport relative to the printing station, that is driven by the transmission in a rotational direction to maintain the cards positioned within the combined magnetic encoding and flipping station during rotation between the first and second rotational positions.

4. A system in accordance with claim 3 comprising:

an idler roller opposed to the drive roller with the cards at the combined magnetic encoding and flipping station being disposed between the idler roller and the drive roller; and

a rotational axis about which the combined magnetic encoding and flipping station rotates between the first and second rotational positions is at a centerline of the combined magnetic encoder and flipping station.

5. A system in accordance with claim 4 wherein:

the centerline is aligned with a path along which the cards move along the transport card when the combined magnetic encoding and flipping station is in the first and second rotational positions.

6. A system in accordance with claim 2 wherein:

the card drive of the combined magnetic encoding and flipping station comprises a drive roller, which drives cards in forward and reverse directions along the card transport relative to the printing station, that is driven by the transmission in a rotational direction to maintain the card positioned within the combined magnetic encoding and flipping station during rotation between the first and second rotational positions.

7. A system in accordance with claim 6 comprising:

an idler roller opposed to the driven roller with the cards at the combined magnetic encoding and flipping station being disposed between the idler roller and the drive roller; and

a rotational axis about which the combined magnetic encoder and flipping station rotates between the first and second rotational positions is at a centerline of the combined magnetic encoding and flipping station.

8. A system in accordance with claim 7 wherein:

the centerline is aligned with a path along while the cards move along the card transport when the combined magnetic encoding and flipping station is in the first and second rotational positions.

9. A combined magnetic encoder and flipper which encodes a magnetic medium on one of two sides of cards which are printed on the two sides comprising:

a magnetic encoder which engages a side of the cards containing the magnetic recording medium for encoding data on the magnetic medium;

an idler roller opposed to the magnetic encoder which engages a side of the cards opposite to a side containing the magnetic medium;

a card drive including a driven roller which engages one of the sides of the cards and an opposed idler roller which engages another of the sides of the cards to drive the cards during encoding of data on the magnetic medium; and

a first motor which rotates the combined magnetic encoder and flipper from a first rotational position to a second rotational position rotated substantially 180° relative to the first rotational position during the printing of the two sides of the cards about an axis of rotation which is at a centerline of the combined magnetic encoder and flipper with an axis of rotation of the driven roller being offset from the centerline.

10. A combined magnetic encoder and flipper in accordance with claim 9 comprising:

a second motor which drives a transmission which drives the driven roller; and

a controller which controls rotation of the first motor so that during flipping of the cards each card is maintained positioned within the combined magnetic encoder and flipper during rotation of the combined magnetic encoder and flipper between the first and second rotational positions.

11. A combined magnetic encoder and flipper in accordance with claim 10 wherein:

the centerline is aligned with a card transport extending through the combined magnetic encoder and flipper along which the cards move during encoding of the magnetic recording medium when the combined magnetic encoder and flipper is in the first and second rotational positions.

12. A combined magnetic encoder and flipper in accordance with claim 10 wherein:

the control of rotation of the second motor adds a component of motion of the cards relative to a position of the cards in the combined magnetic encoder and flipper which substantially cancels an opposite component of motion caused by rotation of the combined magnetic encoder and flipper between the first and second rotational positions.

13. A combined magnetic encoder and flipper in accordance with claim 11 wherein:

the control of rotation of the second motor adds a component of motion of the cards relative to a position of the cards in the combined magnetic encoder and flipper which substantially cancels an opposite component of motion caused by rotation of the combined magnetic encoder and flipper between the first and second rotational positions.

14. A system for processing cards in accordance with claim 1 comprising:

a plurality of serially connected systems in accordance with claim 1, each of the plurality of serially connected systems being connected such that cards which are fed from the printing stations, except a last printing station of the plurality of serially connected systems, are fed to a card input of a next of the plurality of serially connected systems.

15. A system for processing cards in accordance with claim 2 comprising:

a plurality of serially connected systems in accordance with claim 2, each of the plurality of serially connected systems being connected such that cards which are fed from the printing stations, except a last printing station of the plurality of serially connected systems, are fed to a card input of a next of the plurality of serially connected systems.

16. A system for processing cards in accordance with claim 3 comprising:

a plurality of serially connected systems in accordance with claim 3, each of the plurality of serially connected systems being connected such that cards which are fed from the printing stations, except a last printing station of the

plurality of serially connected systems, are fed to a card input of a next of the plurality of serially connected systems.

17. A system for processing cards in accordance with claim 4 comprising:

a plurality of serially connected systems in accordance with claim 4, each of the plurality of serially connected systems being connected such that cards which are fed from the printing stations, except a last printing station of the plurality of serially connected systems, are fed to a card input of a next of the plurality of serially connected systems.

18. A system for processing cards in accordance with claim 5 comprising:

a plurality of serially connected systems in accordance with claim 5, each of the plurality of serially connected systems being connected such that cards which are fed from the printing stations, except a last printing station of the plurality of serially connected systems, are fed to a card input of a next of the plurality of serially connected systems.

19. A system for processing cards in accordance with claim 6 comprising:

a plurality of serially connected systems in accordance with claim 6, each of the plurality of serially connected systems being connected such that cards which are fed from the printing stations, except a last printing station of the plurality of serially connected systems, are fed to a card input of a next of the plurality of serially connected systems.

20. A system for processing cards in accordance with claim 7 comprising:

a plurality of serially connected systems in accordance with claim 7, each of the plurality of serially connected systems being connected such that cards which are fed from the printing stations, except a last printing station of the plurality of serially connected systems are fed to a card input of a next of the plurality of serially connected systems.

21. A system for processing cards in accordance with claim 8 comprising:

a plurality of serially connected systems in accordance with claim 8, each of the plurality of serially connected systems being connected such that cards which are fed from the printing stations, except a last printing station of the

plurality of serially connected systems, are fed to a card input of a next of the plurality of serially connected systems.

22. In a system for processing cards including a magnetic medium extending along one side of the cards and printing on both sides of the cards including a plurality of card processing stations spaced along a card transport extending between a card input and a card output with the stations comprising a combined magnetic encoding and a card flipping station which encodes the magnetic medium and which flips individual cards as held by the combined magnetic encoding and card flipping station from one side after printing the one side to another side to permit printing on the another side of the cards, and a printing station which prints both sides of the cards, a first drive motor which drives a transmission coupling the motor to a card drive associated with each station to transport the cards at each station during processing thereof, a second drive motor which rotates the combined magnetic encoding and card flipping station from a first rotational position to a second rotational position displaced substantially 180° from the first rotational position to flip the cards contained in the combined magnetic encoding and card flipping station, and a controller which controls operation of the stations and the first and second motors a method comprising:

sequentially processing the cards at the combined magnetic encoding and flipping station to encode the magnetic medium, transporting the cards to the printing station to print one of the sides, transporting the cards back to the

combined magnetic encoding and flipping station where the cards are flipped to a reverse orientation of the sides of the cards for printing on the another side of the cards and transporting the cards back to the printing station to print on the another side of the cards.

23. A method in accordance with claim 22 wherein:

the plurality of card processing stations include a smart card encoding station located between the input and the combined magnetic encoder and card flipping station; and wherein

the first drive motor drives the transmission to drive a card drive at the smart card encoding station and the controller causes the cards to be transported by the first motor and transmission from the input to the smart encoding station by the transmission driving the card drive of the smart encoding station where an integrated circuit associated each card is encoded and then each card with the associated encoded integrated circuit is transported to the combined magnetic encoding and flipping station for processing.

24. A method in accordance with claim 22 wherein:

the card drive of the combined magnetic encoding and flipping station comprises a drive roller, which drives cards in forward and reverse directions along the card transport relative to the printing station, that is driven by the transmission in a rotational direction to maintain the cards positioned within the

combined magnetic encoding and flipping station during rotation between the first and second positions.

25. A system in accordance with claim 24 wherein:

an idler roller is opposed to the drive roller with the cards at the combined magnetic encoding and flipping station being disposed between the idler roller and the drive roller; and

a rotational axis about which the combined magnetic encoding and flipping station rotates between the first and second positions is at a centerline of the combined magnetic encoder and flipping station.

26. A method in accordance with claim 25 wherein:

the centerline is aligned with a path along which the cards move along the card transport when the combined magnetic encoding and flipping station is in the first and second rotational positions.

27. A system in accordance with claim 23 wherein:

the card drive of the combined magnetic encoding and flipping station comprises a drive roller, which drives cards in forward and reverse directions along the card transport relative to the printing station, that is driven by the transmission in a rotational direction to maintain the card positioned within the combined magnetic encoding and flipping station during rotation between the first and second positions.

28. A system in accordance with claim 27 wherein:

an idler roller is opposed to the driven roller with the cards at the combined magnetic encoding and flipping station being disposed between the idler roller and the drive roller; and

a rotational axis about which the combined magnetic encoder and flipping station rotates between the first and second positions is at a centerline of the combined magnetic encoding and flipping station.

29. A system in accordance with claim 24 wherein:

the centerline is aligned with a path along which the coils move along the card transport when the combined magnetic encoding and flipping station is in the first and second rotational positions.

30. In a combined magnetic encoder and flipper which encodes a magnetic medium on one of two sides of cards which are printed on the two sides including a magnetic encoder which engages a side of the cards containing the magnetic medium for encoding data on the magnetic medium, an idler roller opposed to the magnetic encoder which engages a side of the cards opposite to a side containing the magnetic medium and a card drive including a driven roller which engages one of the sides of the cards and an opposed idler roller which engages another of the sides of the cards to drive the cards during encoding of data on the magnetic medium, a method comprising:

using a first motor to rotate the combined magnetic encoder and flipper from a first rotational position to a second rotational position rotated substantially 180° relative to the first rotational position during the printing of the two sides of the cards about an axis of rotation which is at a centerline of the combined magnetic encoder and flipper with an axis of rotation of the driven roller being offset from the centerline.

31. A method in accordance with claim 30 comprising:

a second motor which drives a transmission which drives the driven roller; and

using a controller to control rotation of the first motor so that during flipping of the card, each card is maintained positioned within the combined magnetic encoder and flipper during rotation of the combined magnetic encoder and flipper between the first and second rotational positions.

32. A method in accordance with claim 31 wherein:

the centerline is aligned with a card transport extending through the combined magnetic encoder and flipper along which the cards move during encoding of the magnetic recording medium when the combined magnetic encoder and flipper is in the first and second rotational positions.

33. A method in accordance with claim 31 wherein:

the control of rotation of the second motor adds a component of motion of the cards relative to a position of the cards in the combined magnetic encoder and flipper which substantially cancels an opposite component of motion caused by rotation of the combined magnetic encoder and flipper between the first and second rotational positions.

34. A method in accordance with claim 32 wherein:

the control of rotation of the second motor adds a component of motion of the cards relative to a position of the cards in the combined magnetic encoder and flipper which substantially cancels an opposite component of motion caused by rotation of the combined magnetic encoder and flipper between the first and second rotational positions.